

Operating Instructions

Fresh air - Drying cabinet
in explosion-proof version

VFT 60/90



GB

Valid for:

Vötsch
Industrietechnik

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Fresh air - Drying cabinet VFT 60/90

Approval-no.:	TÜV 02 ATEX 1826X		
Unit-no.:	59 526..... 0010		
Production year:	2004		
Installation location:	operation locations in hazardous areas zone 2		
Rated temperature: °C		
Permissible working temperature: °C	Temperature class:	T ...
Rated power:	10,0 kW	Input power:	11,0 kW
Rated current:	16,7 A	Connection diagram:	83066
Voltage:	400V / 3N / PE / 50Hz		
Total vapour volume:	0,4 m³	Working space:	0,35 m³
Flow rate:	2 m³/min	air changes/min.:	about 5

CE Ex II 3G EEx n A P II T ...

Read the Operating Instructions, observe them and keep them close to the device!

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1 IMPORTANT NOTICE / RANGE



Read carefully and observe these operating instructions before erecting and commissioning the unit to avoid errors and the damages caused by them.

Keep the operating instructions close to the device.

1.1 Use according to the regulations



The electrically heated fresh air drying cabinet model VFT is exclusively suitable for:

- Drying and heat treatment of materials emitting vapours and gases which could form an explosive atmosphere with air.
- Combustible materials of the explosion group II A and II B may be used here.
- **Interior space:**
The interior space is explosion proof, corresponding to the ignition temperature classes T2, T3 and T4 and corresponds to the requirements of the device group II, category 2G.
- **Erection location:**
The outside of the unit corresponds to the requirements of the device group II, category 2G.



A forbidden use which is not corresponding to its intended purpose is given at:

- Heating and storing of materials of the explosion group II C and explosive materials.
- Heating of closed containers which are pressurised or could build up a pressure by heating.
- Heating and storing of foodstuffs.
- Enabling the stay of living beings in the dryer and risking their life by that.

If you have doubts about special heat treatment applications please contact us.



Note:

The unit was set in factory to the ignition temperature class requested by the customer (T2, T3 or T4) and this is marked on the unit.

A change / resetting of the ignition temperature class is only possible to be done by the Vötsch-service personnel.

Important notice / range**1.2 Demands to the production manager**

The unit must be operated only by instructed personnel.

Based on these Operating Instructions the production manager has to prepare a corresponding instruction book.

This instruction book has to consider the individual local and working conditions and the language of the operators.

The production manager has to guarantee that all persons working on the unit (dryer) are familiar with the safety information and observe them.



Work on electrical installations and components has to be carried out only by a skilled electrician.

1.3 Instruction book

According to the Guideline 1999/92/EC some actions have to be taken for the protection of the health and the safety of the employees:

The preparation of an explosion protection document is required according to article 8. Within the scope of the risk evaluation required in this article, an estimation of the maximum charge to be loaded has to be carried out.

This may be done e.g. according to ZH 1/10, section E 1.3.4.2, Technical Ventilation! For the estimation according to ZH 1/10 the parameter for the quality factor for the survey of the quality of the air circulation is to be taken as $f = 1$ and for the safety factor as $k_{adm} = 0,7$.

1.4 Charging instruction

The production manager has to establish a charging instruction for each dryer about the maximum admissible charge depending on the charging material.

Note:

The production manager has to provide the instruction book and the charging instruction for the operators and has to make sure that it is observed e. g. by regular training and instruction of the personnel.

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1.5 Guarantee



The unit must not be changed in the version as it was supplied by us.



A guarantee will only be granted if you act according to the directions of these Operating Instructions.



The processes of development, production and shipping are according to the regulations of DIN ISO 9001.



The safety and serviceability of the equipment is only guaranteed if the necessary maintenance and repair works are carried out by either our service engineers or by authorised skilled personnel.

We recommend to conclude a maintenance contract with our service department.



Maintenance and cleaning may be carried out by customer's specialised people.
→ *please see section "7 Maintenance" (page 55)*



Only original spare parts are to be used at maintenance and repair work.



The device was designed, manufactured and checked before delivery according to the regulations of the EC.

Certificate of Conformity / Declaration of Manufacturer:

→ *please see section "10 Documentation" (page 75)*

The explosion protection measures are approved and certified corresponding to the EC prototype test.



The unit was set in factory to the ignition temperature class requested by the customer (T2, T3 or T4) and this is marked on the unit.

A change / resetting of the ignition temperature class is only possible to be done by the Vötsch-service personnel.

Important notice / range

The device corresponds to the safety requirements:

- | | |
|---|--|
| ● EC machine guideline | 98/37/EG |
| ● Low tension guideline | 73/23/EWG |
| ● Dryers and ovens
safety requirements | EN 746-1 |
| ● Safety of machines | EN 12100-1 (2003)
EN 12100-2 (2003) |
| ● Safety in
electric-heating installations | EN 60519-1 EN 60519-2 |
| ● Electrical equipment
of units | EN 60204-1 |
| ● Electromagnetic compatibility
noise emission
noise immunity | EN 61000-6-4
EN 61000-6-2 |
| ● Explosive atmospheres
explosion protection | EN 1127-1 |
| ● Electric resources for
hazardous areas | EN 50021 N |
| ● Installation of electric equipment
in hazardous areas | EN 60079-14 |
| ● Guideline for the adjustment of the
legal regulations of the member countries
for units and protection systems for the use
according to the regulations in hazardous
areas
(Explosion protection order, ATEX 100a) | Guideline 94 / 9 / EG |



The erection and installation of the unit in connection with an correctly executed and properly working ventilation installed by the customer is crucial for the safety against explosions!

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1.6 Special marking / danger indications



ATTENTION / DANGER

If these instructions are not observed this may lead to a hazard for the life of human beings and other living beings of the environment, or to damages of the unit or the loading material.



ELECTRIC POWER

It is used to draw the attention to electric power.
Access to this area is only allowed to skilled electricians.



NOTE

It is used to indicate a support.



HOT SURFACE

The air of the drying space and the parts getting in contact with the air of the drying room may be very hot.
Wear protective clothing (protective gloves)



INJURIES OF THE HANDS

A general danger of injuries like cutting or contusion is indicated.
Wear protective gloves!



DANGER OF EXPLOSION

An explosion may occur if the instructions are not observed.



EXPLOSION PROOF INSTALLATION

Special installations are indicated which have an explosion protection.



Abbreviations

EN = Europäische Norm
= European Standard

EMV = Elektro-Magnetische-Verträglichkeit
= Electromagnetic Compatibility

Important notice / range

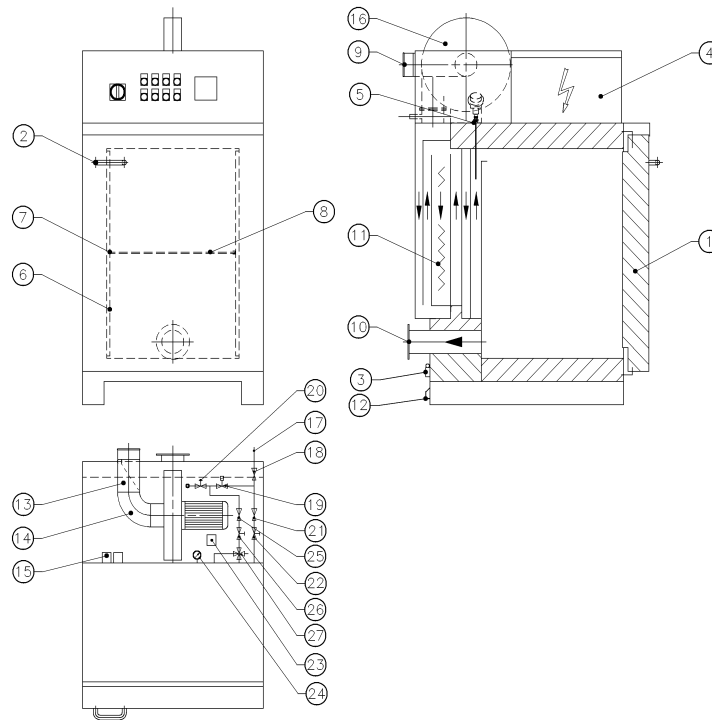
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2 DESCRIPTION OF THE UNIT

2.1 Description of the items

(Description of the standard unit without additional equipment)



- 1 Door
- 2 Door lock
- 3 Door switch
- 4 Switchbox
- 5 Temperature sensor
- 6 Screen rails
- 7 Angular support ^{1.)}
- 8 Insert ^{1.)}
- 9 Supply air fitting
- 10 Exhaust air fitting
- 11 Heater
- 12 Protection conductor connection
- 13 Check valve (fresh air)
- 14 Butterfly damper (fresh air)
- 15 Differential pressure switch (exhaust air)
- 16 Fresh air fan
- 17 Compressed air connection 1/2" female thread
- 18 Pressure-reducer "Compressed air connection"
- 19 Solenoid valve "Emergency flushing"
- 20 Throttle valve "Emergency flushing"
- 21 Pressure-reducer "Internal pressure switchbox"
- 22 Throttle valve "Internal pressure switchbox"
- 23 Differential pressure switch "Internal pressure switchbox"
- 24 Pressure gauge "Internal pressure switchbox"
- 25 Pressure-reducer "Internal pressure switchbox"
- 26 Throttle valve "Switchbox flushing"
- 27 Double 4/2-way valve "Switchbox flushing"

^{1.)} additional equipment

Description of the unit

2.2 Structure

Thermal insulation:

The heating and drying cabinet is a double-wall construction of steel metal sheet and heat insulated with mineral fibre (110 mm).

External housing:

The external housing is made of galvanised steel sheet, lacquered and has a bottom which can be under-run.

Interior housing:

The interior housing is made of stainless steel (material 1.4301) and is welded tight to avoid the penetration of dissolvent fumes into the thermal insulation.

Temperature regulation:

The temperature of the working space is controlled by an electronic temperature regulating system with semiconductor switching elements.

Heating:

The electrical heating is done by tubular heating elements of stainless steel (material 1.4828).

Temperature limitation:

The temperature of the working space is limited by an electronic Safety Temperature Limiter (STL).

The STL is installed inside of the switchbox.

Fresh air fan:

The fresh air fan is on the roof of the unit behind the switchbox.

Vertical air guiding:

The air inlet is at the roof of the working space and the exhaust at the bottom of it.

Safety against explosions:

The safe operation of the unit is guaranteed by the technical ventilation.

Control of the extracted-air:

The extracted-air flow rate is controlled by two flow indicators (differential pressure flow indicators).

Switchbox:

The Switchbox is constructed according to the safety principle of a simplified pressure encapsulation and is provided continuously with compressed air during the operation of the unit.

Pick-up of material:

There are notched rails mounted at the side of the working space for the pick-up of angular supports.

Wire-mesh shelves and charging trays may be placed on the angular supports.

The floor of the working space cannot be loaded.

Total load of the notched rails, the wire-mesh shelves and of the charging trays.

→ please observe section "2.4 Technical data" (page 15)



Note:

If charging trays are placed on the angular supports, the angular supports have to be changed.

The loading instruction for the charging trays has to be observed.

→ please observe section "5.1.1 Loading instruction for charging trays ^{1.)}" (page 36)

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2.3 Function

The fresh air drying cabinet series VFT is designed and constructed according to the valid guidelines and regulations.

Before operating the unit a compressed air supply has to be connected and opened by the customer.

The compressed air pressurises the switchbox.

The pressure of the switchbox is monitored by a pressure switch securing the compressed air supply.

Without the compressed air, only the fresh air fan will be connected after switching on the unit, the heating is not connected.

Before every connecting of the main switch we recommend to flush the switchbox sufficiently by means of the manual valve "Switchbox flushing" to exclude a possibly enriched concentration of solvent in the switchbox.

→ please observe section "5.6.1 Manual flushing of the switchbox" (page 45)

At each start up by switching on the main switch with the door of the unit closed, the heating is connected only after completion of the safety flushing time and the emergency flushing with compressed air and with the exhaust running trouble-free.

When the safety flushing time with the exhaust running trouble-free is passed the emergency flushing with compressed air is disconnected.

The heating is connected next with delay. (Self-control of the STL).

When opening the door of the dryer the heating is switched off.

The fresh air fan keeps running.

When the connected dryer is loaded with feeding material the and the doors are closed, the feeding material in the working space is passed by fresh air.

The safety flushing time passes and the emergency flushing with compressed air is started.

When the safety flushing time with the exhaust running trouble-free has passed the emergency flushing with compressed air is disconnected.

Next the heating is connected with delay. (Self-control of the STL).

The running down of the safety flushing time and starting the emergency flushing with compressed air is repeated at every closing of the door.

The fresh air blown in from a no-load area is guided over an electric heating and fed steadily to the working space.

A multiple air exchange per minute in the working space of the dryer is guaranteed by the fresh air fan.

This air exchange is important for the safety!

The temporary exceeding of the lower explosion limit is allowed in zone 1.

The extracted-air flow rate is controlled by flow switches (differential pressure flow switches).

Description of the unit

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2.4 Technical data

			60/90
Interior space (Working space)		m ³	0,350
Interior dimensions			
Width		mm	570
Height			900
Depth			600
Exterior dimensions			
Width	total	mm	820
Height			1650
Depth			1200
Loading / carrying capacity			
Interior housing	total	kg	150
Floor	surface load	kg	---
Wire-mesh shelves ^{1.)}			
	quantity	max.	13
	concentrated load	kg	10
	surface load		20
Charging trays ^{1.)}			
	quantity	max.	13
	concentrated load	kg	10
	surface load		20
Gratings ^{1.)}			
	concentrated load	kg	50
	surface load		150
Weight (net)		kg	325
Extracted-air flow rate		m ³ /h	120
Air changes / min		approximately	5
Compressed air supply			
Connection cross section			½"
Connection pressure	bar		5 ... 8
Working pressure			4,5
Internal pressure switchbox	mbar		1,0
Safety flushing time (air exchange)		sec.	120
Total vapour volume		m ³	0,400

^{1.)} additional equipment

Description of the unit

		60/90
Sound pressure level (acc. to DIN 45635)		
Normal operation	dB(A)	< 60
Emergency flushing with compressed air		< 80
Ignition temperature class		T1 - T4
Disconnecting temperature		
Safety temperature limiter (STL)		
Ignition temperature class T1 and T2	°C	240
Ignition temperature class T3		175
Ignition temperature class T4		120
Temperature limit cut-out (TLC) ^{1.)}		
Ignition temperature class T1 and T2		230
Ignition temperature class T3		180
Ignition temperature class T4		130
Temperature-Safety Class (acc. to EN 60519-2)		
Safety temperature Limiter (STL)		2
Temperature limit cut-out (TLC) ^{1.)}		2
Installation and working space classification		
Installation place (2,5 m in the door area)	cluster	2
	category	3G
Interior space	cluster	2
	category	2G
Limitation of rated value		
Temperature controller		
Ignition temperature class T1 and T2	°C	200
Ignition temperature class T3		150
Ignition temperature class T4		100
Rated temperature		
Ignition temperature class T1 and T2	°C	200
Ignition temperature class T3		150
Ignition temperature class T4		100
Electrical data		
Rated voltage / frequency		for differing data please see nameplate
		V / Hz 400, 3/(N)PE, AC 50
Ignition temperature class T1, T2, T3 and T4		
Rated current	A	16,7
Rated power	kW	10,0
Input power	kW	11,0

^{1.)} additional equipment

2.5 Electrical equipment of the unit

2.5.1 Temperature controller ^{2.)}

Jumo dTRON 04.1

2.5.2 Temperature controller / Program controller ^{1.) 2.)}

Jumo Dicon 501

2.5.3 Safety temperature limiter (STL) ^{2.)}

Philips TB 40

2.5.4 Temperature limit cut-out (TLC) ^{1.)}

Jumo iTRON

2.5.5 Door switch

Disconnecting of the heating when the door is opened.

Starting of an emergency flushing with subsequent connection of the heating after closing the door.

2.5.6 Heating

Electric heating by means of stainless steel heating elements.

2.5.7 Fresh air fan

The fresh air fan is an EEx version.

2.5.8 Extracted-air monitoring

Differential pressure switches monitor the extracted-air flow rate.

2.5.9 Monitoring of the internal pressure of the switchbox

Differential pressure switches monitors the pressure in the switchbox.

2.5.10 Ex-separator amplifier

Galvanic separation of the differential pressure switches.

2.5.11 Ex-transducer

Galvanic separation of the temperature sensors.

2.5.12 Solenoid valve

Safety flushing of the heating and of the working space with compressed air when the main switch, after every closing of the door and at all malfunctions, is connected

^{1.)} additional equipment

^{2.)} documentation of the equipment in section 10 Documentation

Description of the unit

2.6 Mechanical equipment of the unit

2.6.1 Pick-up of material

Notched rails

Mounted at the side for the pick-up of angular supports.

Total load of the notched rails

→ *please observe section "2.4 Technical data" (page 15)*

Floor of the working space

Not to be loaded

2.6.2 Door seal

silicone

viton ^{1.)}

2.6.3 Throttle valve

There is an adjustable throttle valve in the fresh air feed line in front of the fresh air fan.

2.6.4 Check valve

There is check valve of stainless steel in the fresh air feed line in front of the fresh air fan.

2.6.5 Compressed air connection

Safety flushing of the heating and the working space with compressed air when the main switch is connected, after every closing of the door and at all malfunctions.

Pressurising of the switchbox with compressed air.

2.6.6 Hand valve switchbox flushing

Manual safety flushing of the switchbox with compressed air before each start up.

2.6.7 Angular support ^{1.)}

For the pick-up of inserts.

2.6.8 Inserts ^{1.)}

Wire-mesh shelves

Charging trays

Load of the wire-mesh shelves and of the charging trays

→ *please observe section "2.4 Technical data" (page 15)*

2.6.9 Lead-through ^{1.)}

Gas-tight lead-through at the exterior wall for measuring in the interior space.

Version with blind flange DN 25 KF.

^{1.)} additional equipment

3 SAFETY APPLIANCES



Do not make any manipulation at the safety appliances!
Every unauthorised intervention may have unforeseeable consequences.
Explosion hazard!

The function of the safety appliances has to be checked regularly.
→ *please observe section "7.1 Testing and maintenance" (page 55)*

3.1 Control of the extracted air flow rate



Differential pressure switch

Control of the extracted air flow rate necessary for a safe operation by two differential pressure switches. (**redundant control**)

The differential pressure switches are connected with the corresponding switching amplifier by explosion protected circuits (intrinsically safe).

When the minimum extracted air flow rate is underspent the differential pressure switches disconnect the heating and initialise an emergency flushing of the heating channel and the working space with compressed air.

The malfunction of the extracted air is signalised optically.


The reconnection of the heating is done only at the correct extracted air flow rate.

After the return of the correct extracted air flow rate a safety flushing time runs down. When the safety flushing time ran down without error the emergency flushing with compressed air is disconnected .

Subsequently the heating is connected with delay. (Auto control of the STL)

3.2 Fresh air fan



The fresh air fan is explosion proof according to  EEx e II T4 and is approved according to the PTB-certificate Ex-83/3638.

The fresh air fan provides a constant fresh air flow rate.

This fresh air flow rate is streaming through the heating, the working space and is subsequently extracted through the exhaust gland.

3.3 Control of the internal pressure of the switchbox



Differential pressure switch

Control of the of the internal pressure of the switchbox necessary for a safe operation, by a differential pressure switch.

The Switchbox is constructed according to the safety principle of a simplified pressure encapsulation and is pressurised continuously with compressed air during the operation of the unit.

When the interior pressure of the switchbox is underspent e. g . when the compressed air supply is interrupted, the differential pressure switch disconnects the complete control.

The fresh air fan continues running (fresh air flushing) in order to maintain the safety principle of the unit.

The heating, the temperature control and the other controls are disconnected.

The solenoid valve of the safety flushing with compressed air is open.

The error of the interior pressure of the switchbox is signalled optically and acoustically.


The reconnection of the unit is done only at the correct interior pressure of the switchbox.

After the return of the compressed air a safety flushing time runs down and the safety flushing of the heating channel and of the working spaces with compressed air is started. When the safety flushing time ran down without error the emergency flushing with compressed air is disconnected .

Subsequently the heating is connected with delay. (Auto control of the STL)

3.4 Door switch



The door switch has an explosion protection according to  II 2G EEx d IIC T6 and is approved according to the PTB-test certificate 00ATEX 1006X.



Opening the door:

When the door is opened the heating is disconnected by the door switch.

The fresh air fan stays in operation.

Closing the door:

When the door is closed the safety flushing time is activated by the door switch and the emergency flushing with compressed air is initiated.

When the safety flushing time ran down without error at the exhaust air the emergency flushing with compressed air is disconnected.

Subsequently the heating is connected with delay. (Auto control of the STL).

The running down of the safety flushing time and the starting of the emergency flushing with compressed air is repeated at every closing of the door.

3.5 Temperature limitation



3.5.1 Safety temperature limiter (STL)

Device protection: (thermal safety class 2 acc. to EN 60519-2).

The safety temperature limiter is electrically and functionally independent of the regulating installation.

If the temperature set is exceeded the safety temperature limiter disconnects permanently the heating and initiates the emergency flushing of the heating channel and the working space with compressed air.

The malfunction of the temperature is indicated optically.

Disconnecting temperatur: → *please observe section "2.4 Technical data" (page 15)*

Reset the safety temperature limiter:

The temperature error is reset by operating the key switch "reset" when the releasing temperature is underspent.

After resetting the safety temperature limiter the emergency flushing with compressed air is disconnected and the heating is connected.



Temperature errors, which cause a triggering of the safety temperature limiter are important for the safety.

The device has to be checked to eliminate the reason for the temperature error for the further operation.



3.5.2 Temperature limit cut-out (TLC) ^{1.)}

Material protection: (thermal safety class 2 acc. to EN 60519-2).

The temperature limit cut-out is electrically and functionally independent of the regulating installation.

If the temperature set is exceeded the temperature limit cut-out disconnects permanently the heating and initiates the emergency flushing of the heating channel and the working space with compressed air.

The malfunction of the temperature is indicated optically.

Disconnecting temperatur: → *please observe section "2.4 Technical data" (page 15)*

Reset the selectable temperature limiter:

The temperature error is reset by operating the "P-push button" when the releasing temperature is underspent.

After resetting the temperature limit cut-out the emergency flushing with compressed air is disconnected and the heating is connected.

^{1.)} additional equipment

Safety appliances

3.6 Other Safety Appliances



3.6.1 Main switch

Main switch lockable by a padlock.



3.6.2 Protective motor switch

Overload and short circuit protection of the fresh air fan, the heating and the control voltage by protective motor switches.

When a protective motor switch is triggered the heating is disconnected and the safety emergency flushing of the heating channel and the working space with compressed air is initiated.

The error is indicated optically.



3.6.3 Leakage current circuit breaker


Monitoring of not permissible leakage current of the heating at the housing by a leakage current circuit breaker (FI = 30 mA).

If the leakage current circuit breaker is triggered the heating is disconnected and the emergency flushing air of the heating channel and the working space with compressed is initiated.

The error is indicated optically.




3.6.4 Ex- transducer

The Ex- transducer is explosion proof according to  [EEx ia] II C and is approved according to the Test certificate BAS NR. Ex 94 C 2516.

Galvanic separation of the temperature sensor for the temperature controller and the safety temperature limiter (STL).




3.6.5 Ex- separator amplifier

The Ex-separator amplifier is explosion proof according to  [EEx ia] II C and is approved according to the PTB-Test certificate Ex-94.C.2086.

Galvanic separation of the differential pressure switch for the extracted air monitoring.



3.6.6 Solenoid valve "Emergency flushing"

The solenoid valve "Emergency flushing" is explosion proof according to  EEx m II T4 and is approved according to the Test certificate INERIS 96.D 5058 X.

Safety flushing of the heating and of the working space with compressed air at a breakdown of the control, of the technical ventilation or its monitoring.

The solenoid valve "Emergency flushing" is opened when the current is switched off.



3.6.7 Manual valve "Switchbox flushing"

The manual valve of the switchbox flushing is a manual safety device.

Before every connecting of the main switch we recommend to flush the switchbox sufficiently by means of the manual valve "Switchbox flushing" to exclude a possibly enriched concentration of solvent in the switchbox.

→ please observe section "5.6.1 Manual flushing of the switchbox" (page 45)

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4 ERECTION AND INSTALLATION



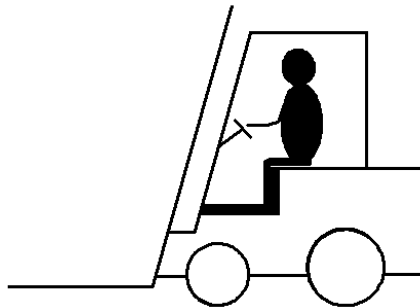
Qualified personnel is required for the transport, erection and installation of the unit!

The corresponding accident prevention rules have to be observed.

4.1 Transport

Shipment is done on a transport pallet.

- Transport the unit to the erecting place with a fork lift or suitable lift truck.
Dead weight: → *please observe section "2.4 Technical data" (page 15)*



- Do not use belts for lifting or erecting the unit!

Unit with a bottom which can be under-run

- Lift the unit carefully at the bottom from the pallet with a fork lift or suitable lift truck.
 - Remove the pallet .
 - Erect the unit at the erecting place.
→ *please observe section "4.3 Erection drawing" (page 27)*



We recommend: keep the pallet parts for service or move

Erection and installation

4.2 Erection

Erection place



The outside of the unit corresponds to the requirements of the device group II, category 3G.

It is allowed to install the unit in an hazardous area zone 2 if gases and vapours are likely not to occur.

If they occur, this will be only seldom or for a short time.



Important note:

It is not allowed to install the unit in hazardous areas zone 1!

The ignition temperature class of the installation room and of the unit have to be matching.

Erecting room	T1	T1 + T2	T1 - T3	T1 - T4
Unit	T1 - T4	T2 - T3	T3 + T4	T4

- Please observe the accident prevention rules.
- Electric equipment in the area of the dryer (2,5 m) have to be suitable for the use in zone 2.
- temperature max. 40 °C
- dry max. 70 % rel. humidity
- sufficiently aerated
- distance from rear side / roof
→ *please observe section "4.3 Erection drawing" (page 27)*
- supply- and exhaust air conducts
→ *please observe section "4.5 Connection of the supply and exhaust air conductions" (page 29)*

Keep the distances indicated in the erection drawing to avoid fire and local overheating of the unit or its surroundings and to guarantee a trouble-free operation of it.

→ *please observe section "4.3 Erection drawing" (page 27)*

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Standard foundation

- non-flammable in a periphery of at least 2,5 m
- flush and horizontal
- free of vibrations
- please observe the loading capacity of the ground
Weight of the unit plus the weight of the charge.
→ *please observe section "2.4 Technical data" (page 15)*

Erecting area

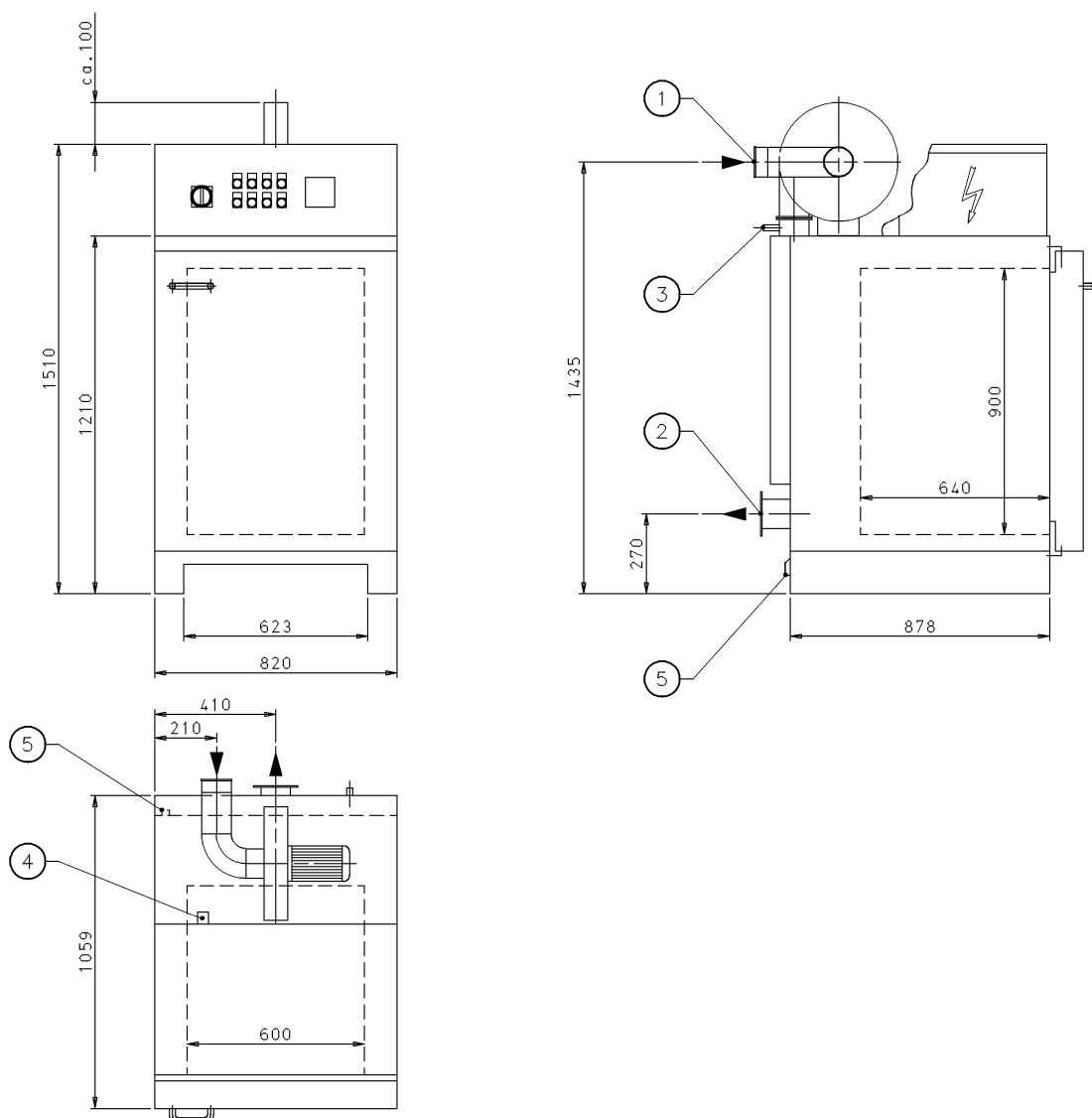
- electrically conductive (against dangerous electrostatic charging)
- temperature resistant erecting ground

Erection and installation

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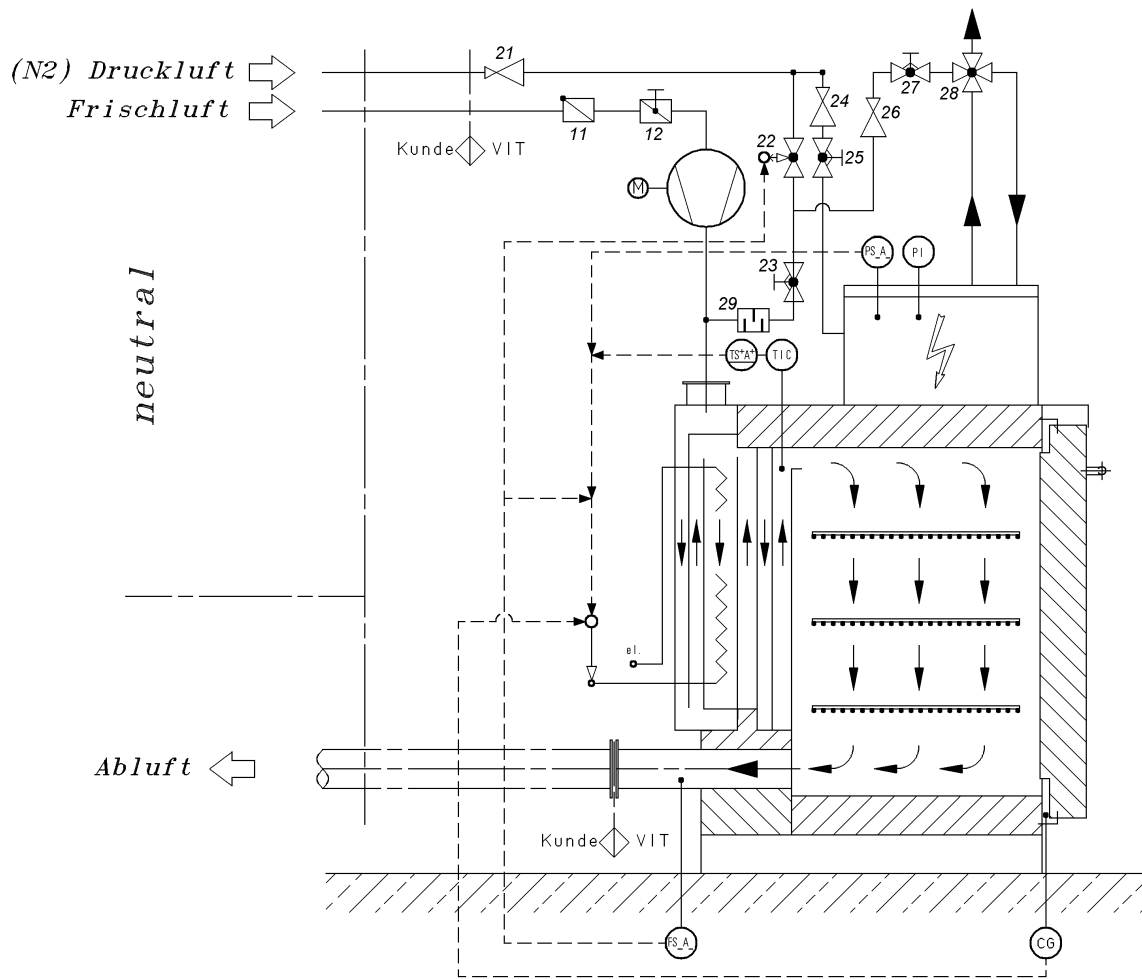
4.3 Erection drawing



- 1 Supply air fitting DN 100
- 2 Exhaust air fitting DN 100
- 3 Compressed air connection 1/2" female thread, 5 ... 8 bar
- 4 Mains connection 400V/3/(N)PE, AC 50Hz / 32A / 5 x 6 mm²
- 5 Protective conductor connection

Erection and installation

4.4 RI-Flow diagram



CG	Door limit switch
FS_A_	Differential pressure switch (exhaust air)
PI	Pressure gauge "Internal pressure switchbox"
PS_A_	Differential pressure switch "Internal pressure switchbox"
TIC	Temperature sensor
TS+A+	Safety temperature limiter (STL)

11	Check valve (fresh air)
12	Butterfly damper (fresh air)

21	Pressure-reducer "Compressed air connection"
22	Solenoid valve "Emergency flushing"
23	Throttle valve "Emergency flushing"
24	Pressure-reducer "Internal pressure switchbox"
25	Throttle valve "Internal pressure switchbox"
26	Pressure-reducer "Switchbox flushing"
27	Throttle valve "Switchbox flushing"
28	Double 4/2-way valve "Switchbox flushing"
29	Silencer

Druckluft	= Compressed air
Frischlucht	= Fresh air
Abluft	= Exhaust air
neutral	= Neutral
Kunde / VIT	= Customer / VIT

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4.5 Connection of the supply and exhaust air conductions



- The connection of the supply and exhaust air conductions has to be done only by qualified persons.



- The total length of the directly connected supply and exhaust air conductions (NW 100) should not exceed 5 m with max. 3 tube bends (90°) ($R > D$).
An additional extension of the conductions reduces the extracted-air flow rate.
- Supply and exhaust air conductions have to be installed separated from each other.
- Check the extracted-air flow rate after finishing the installation and adjust it, if necessary with the mechanical throttle valve in the fresh air conduct.
Extracted-air flow rate: → *please observe section "2.4 Technical data" (page 15)*



If the extracted-air flow rate cannot be adjusted,
contact a service point of Vötsch (see appendix).

4.5.1 Supply air system



The supply air has to be taken from a neutral area which is free of dissolvent vapours (non hazardous area).



The unit has to be connected to the customer's supply air system.

The following has to be considered for the supply air conduct:

- The connection has to be tight (NB 100).
- The connection at the unit's side must not be loaded mechanically.
- The lowest operating temperature of the unit depends on the temperature of the supply air fed.
(Lowest operating temperature = supply air temperature + 5 K)

4.5.2 Exhaust air system



Due to the dissolvent vapours and the thermal load the exhaust air has to be guided into the open air or a neutral area (non hazardous area), we recommend the connection to customer's exhaust air system.



The unit has to be connected to a customer's exhaust air system.

For the discharge of the exhaust air the following has to be considered:

- No possible ignition sources in the in the exhaust air conduction.
- Observation of the respective national valid regulations for emission values.
- The pipes of the exhaust air system have to be of incombustible material (e.g. metal). They have to be installed in a way that no fire hazard could emerge from the developing temperature.

- **Surface temperatures**
($T_{\text{surface}} = \text{operating temperature} < \text{nominal temperature}$)

- A sufficient thermal insulation has to be provided
(e.g. pipe casing of mineral fibre)



A measuring orifice (d = 40mm) has to be installed in the exhaust air conduction at a suitable or accessible place (in a straight tube section, about 1m behind the exhaust air conduct).

This measuring orifice is necessary for the control of the extracted-air flow rate during the maintenance, checking and service work.

At the conduction installation care has to be taken that it is not possible that deposits build up and that an easy cleaning of the exhaust air line is possible.
(Revision orifices, possibility to dismantle sections, etc.)

By the installation of the pipes for exhaust air it has to be granted that eventually existing condensate will not run back to the unit.
(Install the exhaust air conduction if possible with approximately 2% falling gradient from the unit and drain the condensate specifically into e.g. a condensate trap).

The exhaust air of the unit must not be brought together with fuel-gas.



It is only allowed to guide the exhaust air into chimneys if these do not have a connection with fire places or other workshops.

The exhaust air can only be guided into ventilation shafts if these have a fire-resistant separation to other workshops.



Note:

We warn against a connection to an exhaust air system with extraction.

4.5.3 Exhaust air systems without extraction

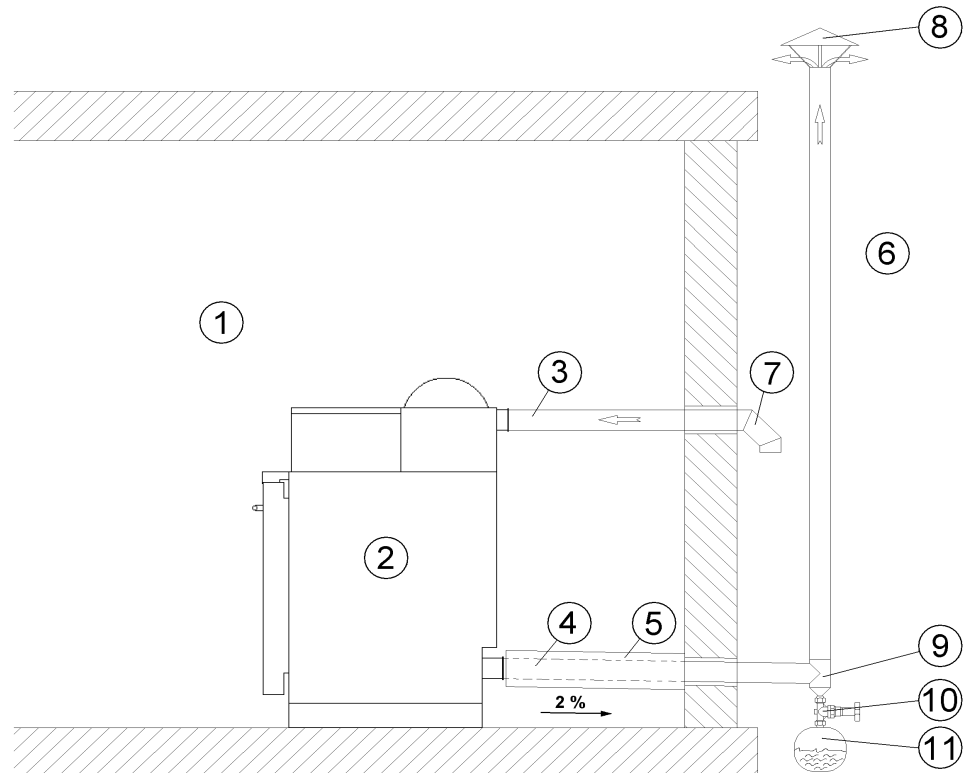


The unit has to be connected directly to an exhaust air line at systems without extraction. It is only possible to connect always one unit to one exhaust air line.

The total resistance to flow with a NB 100 and a total length of 5 m with 3 tube bends (90°) (deducting a possibly existing supply air line and fresh air filter) should not be exceeded at this.



Example for an exhaust air system without extraction:



1 Operating place in hazardous area

- 2 Dryer
- 3 Fresh air conduct
- 4 Exhaust air conduct
- 5 Thermal insulation

6 Operating place in non hazardous area

- 7 Tube bend
- 8 Roof bonnet, deflector bonnet
- 9 Branch
- 10 Shutoff valve for condensate
- 11 Condensate tank

Erection and installation

4.6 Electrical Connection



The electrical connection must be done only by skilled electricians.

- The corresponding national regulations have to be observed for the electrical connection.
- The network conditions have to be in accordance with the data on the nameplate.
- Variations of the mains voltage max. $\pm 10\%$
- Observe the VDE- and technical connection regulations of the local electricity supply company.
- Connection to power supply with clockwise rotating field.
- Information about mains connection and necessary fuse protection on the connection diagram.
- We recommend the connection by means of a leakage current protective switch (FI = 300 mA).



For the connection to the mains supply a cable 5 meters long is connected to the unit with a pull relief on the unit side.



External connection of the protective conductor

- There is a connection of the protective conductor for customer's potential on the rear side of the unit.
- The connection of the protective conductor has to be clean and free of varnish.



Sense of rotation of the motor:

Check the sense of rotation of the fresh air fan:
- Watch the rotation indicating arrow.

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4.7 Connection of the compressed air

The connection of the compressed air supply must be done only by qualified persons.

- The corresponding national regulations have to be observed for the connection of compressed air.
- Connect the compressed air at the rear side behind the switchbox.
The compressed air volume has to be ensured for a time of at least 5 minutes.
Connection pressure: → *please observe section "2.4 Technical data" (page 15)*
- The use of a Pressure-reducer with maintenance unit for filtered and oil-free (condensate-free) compressed air is a must.

**Note:**

If nitrogen N₂ or inert gas is connected instead of compressed air, the risk exists that the installation room of the unit is enriched with the gas when flushing at opened door, as e.g. when the main switch is switched off.

Danger of suffocation!

Erection and installation

4.8 Disassembly

Disassembly of the dryer for a change of location.



Separation of the electrical connection has to be done only by skilled electricians.

Transport of the dryer.

→ please observe section "4.1 Transport" (page 23)



The door has to be removed for safety reasons, to avoid the danger of locking up oneself or somebody.

4.9 Disposal

Disassembly of the unit for disposal.



Separation of the electrical connection has to be done only by skilled electricians.

Transport of the dryer.

→ please observe section "4.1 Transport" (page 23)



Special waste

There are some electrical and electronic components in the unit which have to be disposed of as special waste if necessary.

If desired we take care of a disposal without endangering the environment.



Disposal by the user

If the user disposes of the unit the following has to be carried out:

- The door lock has to be destroyed or one door has to be removed for safety reasons, to avoid the danger of locking up oneself or somebody.
- Carry the special waste to the corresponding appropriate disposal place.



The nationally and locally applicable regulations for the disposal valid at the time of the disposal have to be observed for the other materials and the special waste.

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5 OPERATION



The working regulations and safety notes mentioned below have to be observed for the operation.

Visual check

The dryer has to be checked visually regularly for its perfect condition.
We recommend to do the visual check before each start up of the unit.

Repeating check

We recommend an inspection repeated every year by our service people.
Repeating inspections : → *please observe section "7.2 Repeating inspections"*
(page 56)

5.1 Working rules / Safety notes



The dryer must be used only and exclusively for applications as described in section 1.1 Use according to the regulations!



Do not make any manipulation at the safety appliances!
Every unauthorised intervention may have unforeseeable consequences.
Explosion hazard!

The control and operation of the dryer is only permitted to instructed operators and only according to customer's "**Instruction book**".
→ *please observe section "1.3 Instruction book" (page 6)*



The loading of the dryer is only admissible according to the "**Charging instruction**" of the customer.
→ *please observe section "1.4 Charging instruction" (page 6)*



The loading of the dryer must be done only when the ventilation of the unit is in operation.



Never operate with lacquers made basically of epoxy resin and nitro-cellulose at the same time. (Hazard of spontaneous ignition)

When loading the dryer leave 25 % of the flow cross section free.

The minimum operating temperature is about 5 °K above the supply air temperature.

Observe the MAK- values (maximum workplace concentration) and take care for a sufficient air exchange in the installation room.



Keep the working space and equipment, exhaust air line, etc. clean.
Remove thoroughly loading residues. **Explosion hazard!**



Keep the dryer free of combustible objects and materials and also don't leave them on the dryer

The floor of the working space cannot be loaded.
Total load of the notched rails:

→ *please observe section "2.4 Technical data" (page 15)*



Attention!
**When opening the door care has to be taken
that there are no ignition sources in the dangerous area!**



There are higher temperatures in the region of the door, at heat bridges of the exterior housing and at the piping of exhaust air lines.
There is a risk of burning oneself at the inside of the door when it is opened and at the equipment inside (loading material)!

Recommendation:

Use suitable protection equipment.

For dryers with lead-through at the side: ^{1.)}



Attention!
Operate the device only with closed (gas-tight) feedthrough!



The insertion of parts like measuring sensors through the lead-through into the internal space of the dryer is only allowed when considering the demand of the category 2 according to EN 1127-1.



5.1.1 Loading instruction for charging trays ^{1.)}

If the dryer is equipped with charging trays the angular supports have to be changed in order that the fresh air flows meandering through the working space.

The angular supports without bolts have to be used at the first loading level counting from the top and at every further level with an odd number (1, 3, 5 ...) so that the charging trays can be pushed against the rear wall of the unit.

These charging trays have to be pushed against the rear wall of the unit.

The angular supports at the second loading level counting from the top and at every further level with an even number (2, 4, 6 ...) have to be equipped with a bolt at the rear end, so that the charging trays cannot be pushed against the rear wall of the unit.

These charging trays have to be pushed against these bolts.

5.2 Reaction at malfunctions



If a malfunction is signalised (optical or acoustic signal):

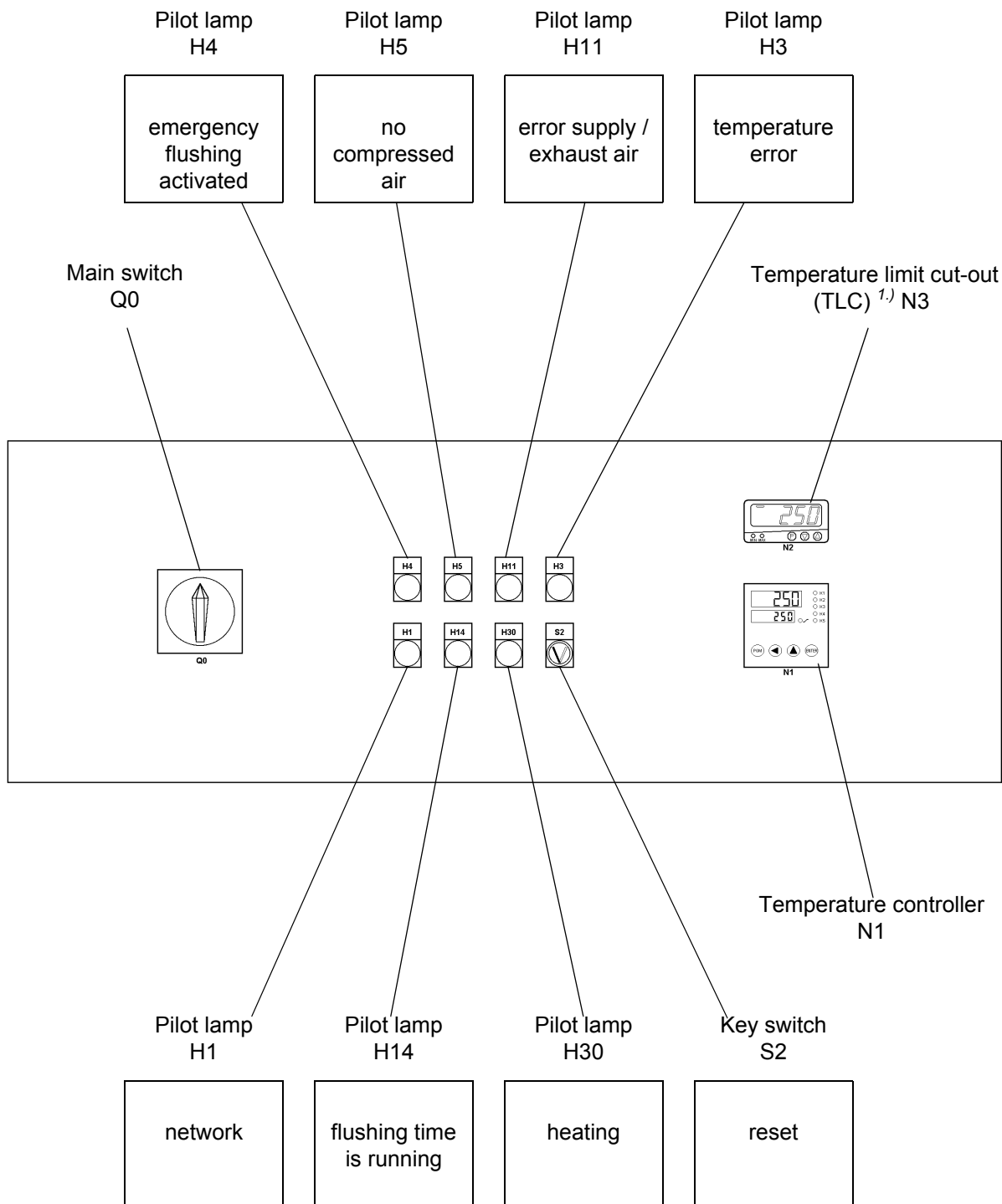
- Keep the door of the dryer closed to enable a flushing with compressed air!
- Do not continue to charge the unit!

After cooling down empty the unit

- Empty the dryer!
- Eliminate the error immediately!

^{1.)} additional equipment

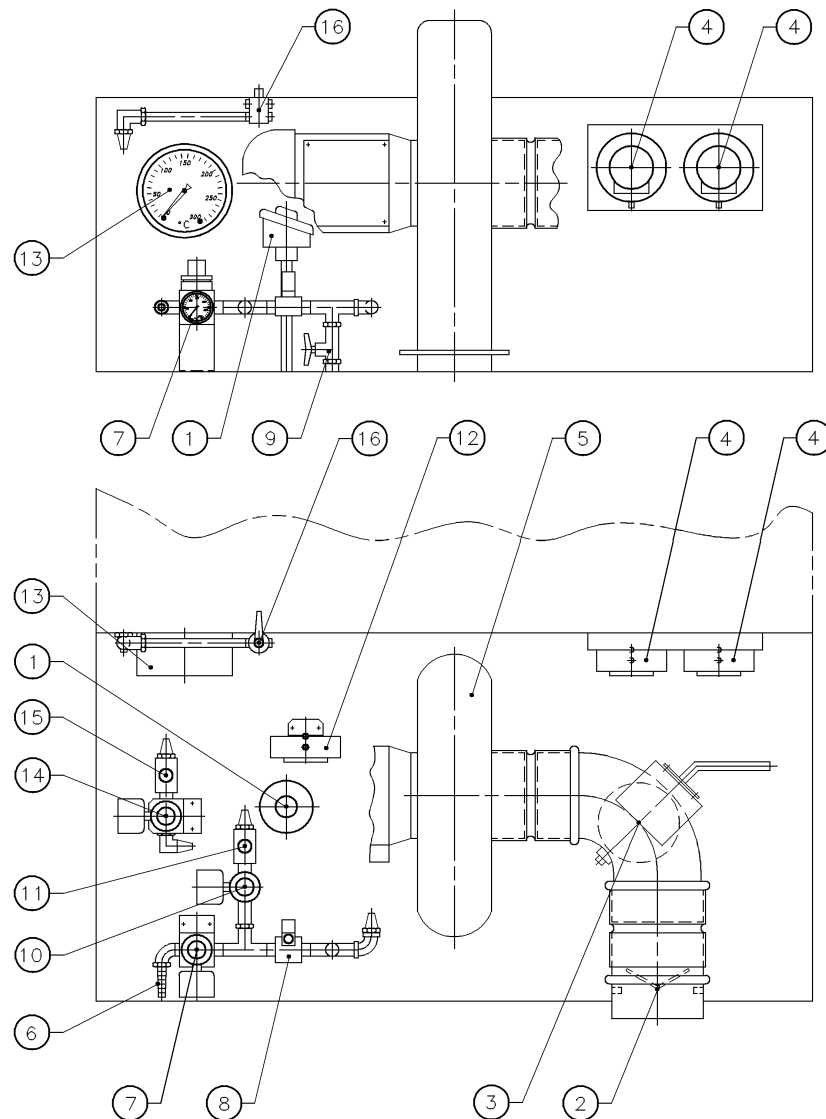
5.3 Switchboard



^{1.)} additional equipment

Operation

5.4 Rear side of switchboard



- 1 Temperature sensor
- 2 Check valve (fresh air)
- 3 Butterfly damper (fresh air)
- 4 Differential pressure switch (exhaust air)
- 5 Fresh air fan
- 6 Compressed air connection 1/2" female thread
- 7 Pressure-reducer "Compressed air connection"
- 8 Solenoid valve "Emergency flushing"
- 9 Throttle valve "Emergency flushing"
- 10 Pressure-reducer "Internal pressure switchbox"
- 11 Throttle valve "Internal pressure switchbox"
- 12 Differential pressure switch "Internal pressure switchbox"
- 13 Pressure gauge "Internal pressure switchbox"
- 14 Pressure-reducer "Internal pressure switchbox"
- 15 Throttle valve "Switchbox flushing"
- 16 Double 4/2-way valve "Switchbox flushing"

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5.5 First commissioning



The following checks have to be carried out before the first commissioning by an expert.

General check:

- The ignition temperature class of the unit has to be suitable for the erection location.
- Correct connection of the mains supply.
- Correct connection of the supply air and exhaust air lines.
- **Correct connection of the compressed air supply.**
Before every connecting of the main switch we recommend to flush the switchbox sufficiently by means of the manual valve "Switchbox flushing" to exclude a possibly enriched concentration of solvent in the switchbox.
Open the manual valve of the switchbox flushing and control the safety flushing of the switchbox manually.
→ please observe section "5.6.1 Manual flushing of the switchbox" (page 45)
- Check the motor safety devices in the switchbox, unlock if necessary.



Note:

For the correct check and the first commissioning the cover of the switchbox has to be closed to enable the overpressure in it.

The cover of the switchbox has to be opened and closed again every time for interventions which are required for the operation of components during an inspection.

The casing has to be dismantled for the first commissioning and mounted again after that.

- **Open the shutoff valve** of the compressed air supply.
 - Emergency flushing of the heating channel and of the working space are initiated.
- **Check the following sections.**
 - 5.5.1 Check of the fresh air fan and the heating
 - 5.5.2 Check the error message exhaust air
 - 5.5.3 Check the error message internal pressure switchbox
 - 5.5.4 Check of the error message temperature (TLC) ^{1.)}
 - 5.5.5 Check of the error message temperature (STL)



After completion of the first commissioning:

- Prepare a commissioning protocol.
- Entry in the device log book.

^{1.)} additional equipment



5.5.1 Check of the fresh air fan and the heating

- **Connect the main switch** at door closed and **check the sense of rotation** of the fresh air fan.
 - Fresh air fan is connected, pilot lamp "Network on" is shining.
 - Safety flushing time is activated, pilot lamp "Flushing time is running" is shining.
 - Emergency flushing of the heating channel and the working space with compressed air is started, pilot lamp "Emergency flushing activated" is shining.
 - Heating disconnected, Pilot lamp "Heating" goes out.
- **Check the power consumption** of the fresh air fan at the motor connecting terminals.
- **Check the extracted-air flow rate** at the extracted air gland.
Extracted-air flow rate: → *please see section "2.4 Technical data" (page 15)*



After exchanging the air several times in the heating channel and the working space by the fresh air flow (Safety flushing time) and the injection of compressed air (Emergency flushing):

Safety flushing time: → *please see section "2.4 Technical data" (page 15)*

- Safety flushing time finished, pilot lamp "Flushing time is running" goes out.
- Emergency flushing of the heating channel and of the working space with compressed air is disconnected, pilot lamp "Emergency flushing activated" goes out.
- Safety temperature limiter (STL) is connected.
- Heating is connected with delay, pilot lamp "Error temperature" is shining for about 15 sec, (self-monitoring of the STL).
- Pilot lamp "Heating" is shining.
- **Set the rated temperature value** at the temperature controller higher than room temperature.
- **Check the power consumption** of the heating at the heating terminals in the heating box.
- **Open the door.**
 - Heating is switched off, pilot lamp "Heating on" goes out.
 - Safety temperature limiter (STL) is disconnected.
 - Fresh air fan is still operating.
- **Close the door.**
 - Safety flushing time is activated, pilot lamp "Flushing time is running" is shining.
 - Emergency flushing of the heating channel and the working space with compressed air is started, pilot lamp "Emergency flushing activated" is shining.
 - Heating disconnected, pilot lamp "Heating" goes out.



After exchanging the air several times in the heating channel and the working space by the fresh air flow (Safety flushing time) and the injection of compressed air (emergency flushing):

Safety flushing time: → *please see section "2.4 Technical data" (page 15)*

- Safety flushing time finished, pilot lamp "Flushing time is running" goes out.
- Emergency flushing of the heating channel and of the working space with compressed air is disconnected, pilot lamp "Emergency flushing activated" goes out.
- Safety temperature limiter (STL) is connected.
- Heating is connected with delay, pilot lamp "Error temperature" is shining for about 15 sec, (Self-monitoring of the STL).
- Pilot lamp "Heating" is shining.



5.5.2 Check the error message exhaust air

The check of the error message “Exhaust air” has to be done in the correct heating operation when the safety time flushing is run down.

Check the function of the differential pressure switches **one by one**.

- **Pull off the measuring hoses at the differential pressure switches F10 and F10.1** of the exhaust air monitoring (rear side of the unit).
 - Pilot lamp “Error differential pressure fresh air fan” is shining.
 - Heating is disconnected, pilot lamp “Heating on” goes out.
 - Safety temperature limiter (STL) is disconnected.
 - Emergency flushing of the heating channel and the working space with compressed air is started, pilot lamp “Emergency flushing activated” is shining.
- **Push on and fasten the measuring hoses at the differential pressure switches F10, and F10.1** of the exhaust air monitoring (rear side of the unit).
 - Pilot lamp “Error differential pressure fresh air fan” goes out.
 - Emergency flushing of the heating channel and the working space with compressed air is disconnected, pilot lamp “Emergency flushing activated” goes out.
 - Safety temperature limiter (STL) is connected.
 - Heating is connected with delay, pilot lamp “Error temperature” is shining for about 15 sec, (Self-monitoring of the STL).
 - Pilot lamp “Heating” is shining.



5.5.3 Check the error message internal pressure switchbox



The check of the error message “Internal pressure switchbox” has to be done in the correct heating operation when the safety time flushing is run down.

- **Pull off the measuring hose at the differential pressure switch F3** of the Internal pressure switchbox monitoring at the rear side of the unit.
 - Pilot lamp “No compressed air” is shining.
 - Heating is switched off, pilot lamp “Heating” goes out.
 - Safety temperature limiter (STL) is disconnected.
 - Emergency flushing of the heating channel and the working space with compressed air is started, pilot lamp “Emergency flushing activated” is shining.
 - Acoustic alarm in the switchbox sounds.
 - Fresh air fan stays connected, pilot lamp “Network on” is shining.



Note:

The check of the error message “Internal pressure switchbox” can be done also by closing the compressed air supply.

- **Close the shutoff valve** of the compressed air supply.
 - Pilot lamp “No compressed air” is shining.
 - Heating is disconnected, pilot lamp “Heating on” goes out.
 - Safety temperature limiter (STL) is disconnected.
 - Emergency flushing of the heating channel and the working space cannot be started due to the missing compressed air.
 - Acoustic alarm in the switchbox sounds.
 - Fresh air fan stays connected, pilot lamp “Network on” is shining.
- **Push on and fasten again the measuring hoses at the differential pressure switch F3** of the Internal pressure switchbox monitoring at the rear side of the unit.
 - Pilot lamp “No compressed air” goes out.
 - Emergency flushing activated, pilot lamp “Flushing time is running” is shining.
 - Heating stays disconnected, pilot lamp “Heating” goes out.



Note:

If the check of the error message “Internal pressure switchbox” was done by closing the compressed air supply.

- **Open the shutoff valve** of the compressed air supply.
 - Pilot lamp “No compressed air” goes out.
 - Emergency flushing of the heating channel and the working space with compressed air is started, pilot lamp “Emergency flushing activated” is shining.
 - Pilot lamp “Flushing time is running” is shining.
 - Heating stays disconnected, pilot lamp “Heating” goes out.



After exchanging the air several times in the heating channel and the working space by the fresh air flow (Safety flushing time) and the injection of compressed air (Emergency flushing):

Safety flushing time: → *please see section “2.4 Technical data” (page 15)*

- Safety flushing time finished, pilot lamp “Flushing time is running” goes out.
- Emergency flushing of the heating channel and the working space with compressed air is disconnected, pilot lamp “Emergency flushing activated” goes out.
- Safety temperature limiter (STL) is connected.
- Heating is connected with delay, pilot lamp “Error temperature” is shining for about 15 sec, (Self-monitoring of the STL).
- Pilot lamp “Heating” is shining.

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5.5.4 Check of the error message temperature (TLC) ^{1.)}

The check of the error message “Temperature (TLC) ^{1.)}” has to be done in the correct heating operation.

- **Connect the main switch.**

Secure the heating operation of the unit with its safety flushing time and the self-monitoring of the STL.

→ please see section “5.5.1 Check of the fresh air fan and the heating” (page 40)

- **Set the TLC to a temperature **lower** than the current temperature.**

(Operating: → please see section “5.6.4 Temperature limit cut-out (TLC) ^{1.)}” (page 50)

- Temperature limit cut-out (TLC) switches off, pilot lamp “Temperature error” is shining.
- Heating is disconnected, pilot lamp “Heating” goes out.
- Emergency flushing of the heating channels and of the working space with compressed air is started, pilot lamp “Emergency flushing activated” is shining.

- **Set the TLC again to a temperature **higher** than operating temperature.**

- **Acknowledge the error of the temperature limit cut-out (TLC):**

Press the P-key for 3 sec.

- Temperature limit cut-out (TLC) switches on, pilot lamp “Temperature error” goes out.
- Emergency flushing of the heating channels and of the working space with compressed air is switched off, pilot lamp “Emergency flushing activated” goes out.
- Heating is connected, Pilot lamp “Heating” is shining.

^{1.)} additional equipment



5.5.5 Check of the error message temperature (STL)

The check of the error message “Temperature (STL)” has to be done in the correct heating operation.

Instead of the installed temperature sensor PT 100 an external decade resistor has to be connected which can generate different resistance values.

- **Disconnect the main switch.**
- **Disconnect the temperature sensor PT 100 and connect a calibrated a decade resistor to simulate the temperature sensor PT 100.**
- **Connect the main switch.**
Secure the heating operation of the unit with its safety flushing time and the self-monitoring of the STL.
→ please see section “5.5.1 Check of the fresh air fan and the heating” (page 40)
- **Set the resistance value at the decade resistor for 5°C below the switch-off temperature of the Safety temperature limiter (STL).**
(see the below table)
 - Safety temperature limiter (STL) must not trigger.
 - The heating operation of the unit is continued.
- **Set the resistance value at the decade resistor for 10°C above the switch-off temperature of the Safety temperature limiter (STL).**
(see the below table)
 - Safety temperature limiter (STL) switches off, pilot lamp “Temperature error” is shining.
 - Heating is disconnected, pilot lamp “Heating” goes out.
 - Emergency flushing of the heating channels and of the working space with compressed air is started, pilot lamp “Emergency flushing activated” is shining.
- **Underspend the resistance value at the decade resistor for the switch-off temperature of the safety temperature limiter (STL).**
(see the below table)
- **Acknowledge the error of the safety temperature limiter (STL):**
Operate the switch key “reset”.
 - Safety temperature limiter (STL) switches on, pilot lamp “Temperature error” goes out.
 - Emergency flushing of the heating channels and of the working space with compressed air is switched off, pilot lamp “Emergency flushing activated” goes out.
 - Heating is connected, Pilot lamp “Heating” is shining.

Resistance values for the switch-off temperature of the safety temperature limiter (STL)

Ignition temperature class	T1	T2	T3	T4
Resistance value at switch-off temperature	240 °C 190,45 Ohm	240 °C 190,45 Ohm	175 °C 166,61 Ohm	120 °C 146,06 Ohm
Resistance value at 5°C above switch-off temperature	245 °C 192,26 Ohm	245 °C 192,26 Ohm	180 °C 168,46 Ohm	125 °C 147,94 Ohm
Resistance value at 5°C below switch-off temperature	235 °C 188,63 Ohm	235 °C 188,63 Ohm	170 °C 164,76 Ohm	115 °C 144,17 Ohm

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5.6 Operating the device



For the operating of the equipment see separate operating instructions section 10 Documentation.



5.6.1 Manual flushing of the switchbox

Before every connecting of the main switch we recommend to flush the switchbox sufficiently by means of the manual valve "Switchbox flushing" to exclude a possibly enriched concentration of solvent in the switchbox.



Attention!

Flush the switchbox for at least 24 minutes before start up or connecting the main switch!

Volume of the switchbox: 121 litres

10-times air exchange: in about 24 minutes

- **Open the shutoff valve** of the compressed air supply.
 - Safety flushing of the heating channel and of the working space with compressed air is started.
- **Open the manual valve** of the compressed air supply.
 - Safety flushing of the switchbox is started.
- **Close the manual valve** of the switchbox flushing.
 - Safety flushing of the switchbox is finished.
- **Close the shutoff valve** of the compressed air supply.
 - Safety flushing of the heating channel and of the working space with compressed air is switched off.



5.6.2 Check of the internal pressure monitoring of the switchbox

This check has to be done daily by the operators before starting up the unit.



This check has to be documented in the unit log book.

further checks: → *please see section "7.2 Repeating inspections" (page 56)*

- **Switch the main switch on** at closed compressed air supply.
 - Pilot lamp "No compressed air" is shining.
 - Acoustic alarm in the switchbox sounds.
 - Fresh air fan is connected, pilot lamp "Network on" is shining.
 - Heating stays disconnected, pilot lamp "Heating" goes out.
- **Open the shutoff valve** of the compressed air supply.
 - Pilot lamp "No compressed air" goes out.
 - Acoustic alarm in the switchbox stops.
 - Emergency flushing of the heating channel and the working space with compressed air is started, pilot lamp "Emergency flushing activated" is shining.
 - Safety flushing time activated, pilot lamp "Flushing time is running" is shining.
 - Fresh air fan stays connected, pilot lamp "Network on" is shining.
 - Heating stays disconnected, pilot lamp "Heating" goes out.



After exchanging the air several times in the heating channel and the working space by the fresh air flow (Safety flushing time) and the injection of compressed air (Emergency flushing):

Safety flushing time: → *please see section "2.4 Technical data" (page 15)*

- Safety flushing time finished, pilot lamp "Flushing time is running" goes out.
- Emergency flushing of the heating channel and the working space with compressed air is disconnected, pilot lamp "Emergency flushing activated" goes out.
- Heating is connected with delay, pilot lamp "Error Temperature" is shining for about 15 sec. (Self-monitoring of the STL).
- Pilot lamp "Heating" is shining.

- **Set the temperature controller.**

(Operating: → *please see section "5.6.3 Temperature controller (short instruction)" (page 49)*)

- Temperature indication on the temperature controller.
- Temperature controller Jumo dTRON 04.1



- **Set the temperature limit cut-out (TLC)** ^{1.)} at 10 °C above operating temperature.
For operation: → *please see section "5.6.4 Temperature limit cut-out (TLC) ^{1.)}" (page 50)*

- **Set the temperature controller / program controller.** ^{1.)}

(Operating: → *please see section "5.6.5 Temperature controller / program controller (short instruction)" (page 51)*)

- Temperature indication on the temperature controller.
- Temperature controller Dicon 501

^{1.)} additional equipment



The dryer must be loaded only when the ventilation (fresh air fan) is operating and the compressed air supply was opened and if they continue to operate until the drying is finished.



- **Charging** the dryer is done **before or after heating up** depending on the working process.
- **Open the door.**
 - Heating is switched off, pilot lamp "Heating on" goes out.
 - Fresh air fan continues to run.
- **Load the dryer.**
- **Close the door.**
 - Safety flushing time activated, pilot lamp "Emergency flushing activated" is shining.
 - Emergency flushing of the heating channel and the working space with compressed air is started, pilot lamp "Emergency flushing activated" is shining.
 - Heating stays disconnected, pilot lamp "Heating" goes out.



After exchanging the air several times in the heating channel and the working space by the fresh air flow (Safety flushing time) and the injection of compressed air (emergency flushing):

Safety flushing time: → *please see section "2.4 Technical data" (page 15)*

- Safety flushing time finished, pilot lamp "Flushing time is running" goes out.
- Emergency flushing of the heating channel and the working space with compressed air is disconnected, pilot lamp "Emergency flushing activated" goes out.
- Heating is connected with delay, pilot lamp "Error Temperature" is shining for about 15 sec, (Self-monitoring of the STL).
- Pilot lamp "Heating" is shining.

Operation

After the heat treatment or for cooling down the dryer:

- **Open the door:**
 - Heating is disconnected, pilot lamp "Heating on" goes out.
 - Fresh air fan continues to operate.
- **Empty the dryer!**
- **Close the door:**

The running down of the safety flushing time, the starting of the emergency flushing with compressed air and the delayed connection of the heating is repeated at every closing of the door.

Shut down



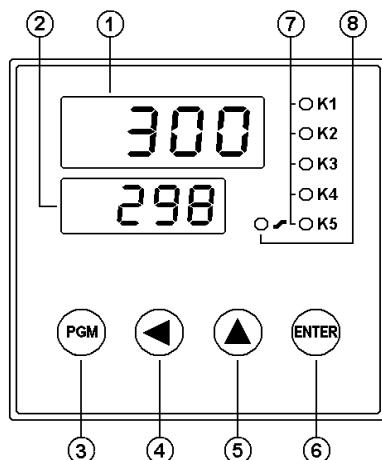
- **Switch off the main switch.**
 - Emergency flushing of the heating channel and of the working space with compressed air is started.
 - Unit is switched off.
- **Close the shutoff valve** of the compressed air supply.

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5.6.3 Temperature controller (short instruction)

Jumo dTRON 04.1



- 1 Actual indication**
7-segment display, red
- 2 Rated value indication**
7-segment display, green
- 3 PGM-key**
Advance of the levels
- 4 Digit-key**
Selection of the decimal point when entering
- 5 Increase-value-key**
Increasing of the decimal point value
- 6 ENTER-key**
Confirming of the input
- 7 Indication of the connecting position**
Indication of the connected output
- 8 Ramp function**
Indication of the ramp function

Setting / changing of rated value

Normal display

- The real value is in the upper display.
- The rated value is in the lower display..

- **Press the PGM-key.**
 - The rated value is shown in the upper display.
 - The indication SP 1 is shown in the lower display.
- **Press the Digit-key.**
 - A decimal point of the rated value blinks in the upper display.
- **Press the Increase-value-key.**
 - The value of the decimal point is increased in the upper display

Continue pressing the Digit-key and the Increase-value-key until the rated value wanted is shown.

- **Press the ENTER-key.**
 - The blinking of the decimal point in the upper display is stopped.
 - The rated value is stored.
- **Press the PGM-key 3 x.**
 - The real value is shown in the upper display.
 - The rated value is shown in the lower display.



For the further operating of the temperature controller: → *please see section "10 Documentation" (page 75)*

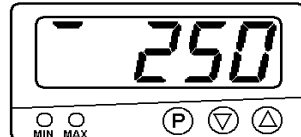


5.6.4 Temperature limit cut-out (TLC) ^{1.)}

- Set the temperature limit cut-out at 10 °C above operating temperature.

Setting depending on the purpose of the protection:

1. Protection of the material at rated temperature and protection of the unit at the same time:
Setting to final value:
Disconnecting temperature: → *please observe section "2.4 Technical data" (page 15)*
2. Material protection at operating temperature:
Setting above the operating temperature wanted.



Indication of the current alarm value:

- Operate the **P-key** 1 x shortly.
 - The display shows "**AL**" alternating with the value of the current alarm value. (Alarm Low)

Indication of the current real value:

- Operate the **P-key** 2 x shortly.
 - The display shows "**InP**" alternating with the value of the current real value. (Input)

Indication of the current set value (disconnecting temperature):

- Operate the **P-key** 3 x shortly.
 - The display shows "**AH**" alternating with the value of the current set value. (Alarm High)

Changing / setting of the switch-off-temperature "**MAX**":

- Press the **P-key** and the **Increase-value-key** at the same time for approximately 3 sec.
 - The display shows "**AH**" alternating with the value of the active set value.
- Press the **Decrease-value-key** or **Increase-value-key** alternatively.
 - The selected value is shown on the display.

Storing of the cut-off temperature:

- Press the **P-key**.
 - The value selected is stored.
 - The value of the current cut-off temperature is shown on the display.

If the set temperature is exceeded the TWB disconnects the heating permanently at all terminals.

- Pilot lamp "**MAX**" at TWB is shining.
- The indication of the active set value on the display flashes as long as the disconnecting temperature is exceeded.

After the reducing the temperature under cut-off temperature:

- Pilot lamp "**MAX**" on TWB is blinking.
- The flashing of the indication is stopped, the display shows the active set value.

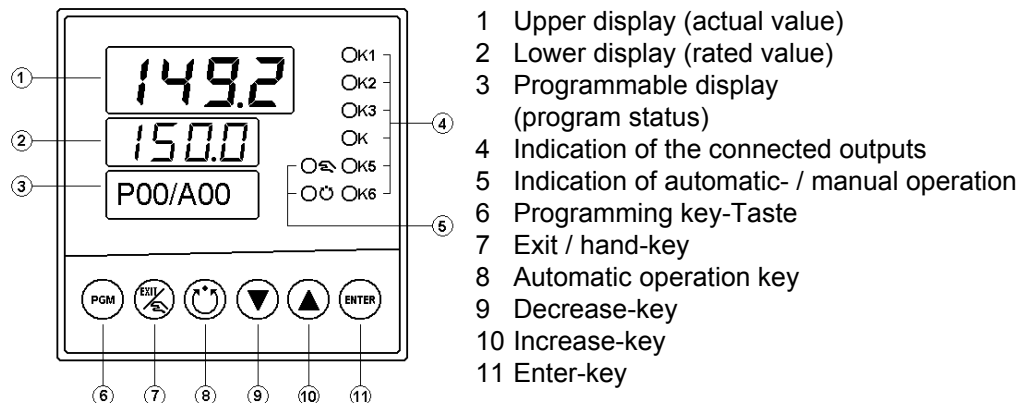
Acknowledgement of a temperature error:

- Press the **P-key** for 3 sec.
 - The TWB is reset.
 - The flashing of the pilot lamp "**MAX**" at the TWB is stopped.

^{1.)} additional equipment

5.6.5 Temperature controller / program controller (short instruction)

Jumo Dicon 501 ^{1.)}



Setting / changing of rated value

Normal display

- The real value is in the upper display.
- The rated value is in the lower display.

● Press the increase / decrease-value-key.

- "PGM HAND" is shown in the Matrix-display.
- The pilot lamp "Manual operation" on the temperature controller is shining.

● Press the increase / decrease-value-key.

- The value of the decimal point is changed in the Matrix-display.

Continue pressing the Increase-value-key and the Decrease-value-key until the rated value wanted is shown.

● Press the ENTER-key or wait for 3 sec.

- The rated value is stored.

Switch off the rated value manual operation

● Press the EXIT / HAND-key.

- "PGM HAND" goes out in the Matrix-display, "GRUNDSTELLUNG" = "Basic position" is shown.
- The pilot lamp "Manual operation" on the temperature controller goes out.
- The pilot lamp "Automatic operation" on the temperature controller is shining.



For the further operating: → please see section "10 Documentation" (page 75)

^{1.)} additional equipment

Operation

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6 ERROR DIAGNOSIS



Failures are to be corrected only by expert skilled personnel.

Error	Cause	Remedy
No indication on the controller display no indication of the pilot lamp	No mains or control voltage	Check the voltage, mains and control fuses
Error message at the controller	See operating instructions of the controller	See operating instructions of the controller
Fresh air fan switched off	Motor protection switch has triggered	Press on-key; Check the motor protection switch
Error message "Differential pressure fresh air fan" is shining	Differential pressure switch "Exhaust air" has triggered	a.) Check the differential pressure switch "Exhaust air", the measuring hoses, the measuring unit and the Supply- and Exhaust air lines b.) Check the setting range of the Differential pressure switches c.) Check the extracted-air flow rate
Error message "Internal pressure switchbox" is shining and acoustic alarm inside the switchbox sounds	a.) Differential pressure switch "Internal pressure switchbox" has triggered b.) Lack of compressed air	a.) Check the compressed air supply b.) Check the differential pressure switch "Internal pressure switchbox" and the measuring hoses
Heating switched off, (fresh air fan off)	a.) Door opened b.) Door switch operated at closed door	a.) Close the door b.) Check the door switch and the actuation
Heating switched on, (no temperature rise)	a.) Error message at the temperature controller b.) Rated value on the temperature controller is below the actual value	a.) See operating instructions of the temperature controller b.) Check the rated value on the temperature controller

Error diagnosis

Error	Cause	Remedy
Heating switched off, Error message "Temperature" is shining	a.) * STL has switched off b.) Sensor breakage on the temperature sensor (Pt100) of the safety temperature limiter (STL)	a.) ** Operate the key switch "Reset" b.) Check the temperature sensor
Heating switched off, Error message "Temperature" is shining	a.) * TLC has switched off b.) Sensor breakage on the temperature sensor (Pt100) of the temperature limit cut-out (TLC)	a.) ** Press the P-key for 3 sec b.) Check the temperature sensor

Errors occurring are to be eliminated immediately by authorised skilled persons!

If operating modes or error modes are not indicated by the white or red pilot lamp respectively, check additionally the glow lamp.

When the technical ventilation fails by malfunction of the fresh air fan or failure of the exhaust air monitoring an emergency flushing of the heating and of the working space with compressed air is started.

* Safety component, if the error cannot be eliminated, please consult a service point of Vötsch.

** Reset only when the unit is cooled down by about 10 °C.

If the errors are repeating please consult a service point of Vötsch.



^{1.)} additional equipment

7 MAINTENANCE



The safety and serviceability of the unit is only guaranteed if the necessary checks and repair works are carried out either by authorised, skilled personnel or by our service people.

We recommend to conclude a maintenance contract with our service department.

The cleaning work may be done by an expert user.



Expert is a person who by his technical education and experience has sufficient knowledge in the section of the fresh air drying cabinets and is familiar with the corresponding workers' protective regulations and the regulations and standards.

Before the maintenance and repair work:

- Get a written authorisation to start work from the operator of the installation.
- Hazardous conditions must not appear by an explosive atmosphere in the surroundings of the unit.
- Switch off the main switch and secure it against reconnection.



After finishing the maintenance and repair work:

- The correct status of the unit has to be checked and secured before starting it up again.

Please indicate the data of the nameplate if you contact us for questions or spare parts orders!

Service address: → *please see section "10 Documentation" (page 75)*

7.1 Testing and maintenance



The dryer and its safety appliances have to be tested by an expert regularly and at appropriate intervals, but at least once a year!

We recommend an inspection repeated every year by our service people.

Repeating inspections: → *please observe section "7.2 Repeating inspections" (page 56)*

The tests have to be documented.

We recommend to record the tests proof in a test book or in an EDP documentation.
The test may be shown by a badge.

Maintenance**7.2 Repeating inspections****7.2.1 Test the differential pressure switches exhaust air**

The monitoring of the extracted-air flow rate is done by two differential pressure switches. (redundant monitoring)

The tests of the differential pressure switches are to be carried out only by qualified experts.

- Test the measuring hoses and measuring sets of the exhaust air for free passage and clean them if there is condensate.
- Test the function of the differential pressure switches for exhaust air individually.
- Pull off the measuring hoses of the differential pressure switches when the unit is connected and check the error message of the exhaust air.

If the function of the differential pressure switches is OK the error indication has to react and the heating has to switch off if it was connected before.

The heating channel and the working space is emergency flushed with compressed air.

- Reconnect the measuring hoses correctly.

Replace damaged measuring hoses and measuring sets or differential pressure switches for exhaust air.

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7.2.2 Test the differential pressure switch internal pressure switchbox

The tests of the differential pressure switch are to be carried out only by qualified experts.

- Test the measuring hoses and measuring sets of the internal pressure switchbox for free passage and clean them if they are polluted.
- Test the function of the differential pressure switches for the internal pressure switchbox.
- Pull off the measuring hoses of the differential pressure switches when the unit is connected and check the error message of the internal pressure switchbox.

If the function of the differential pressure switch of the internal pressure switchbox is OK, the optical error indication has to react, the acoustic alarm has to sound and the heating has to switch off, when it was connected before.

- Reconnect the measuring hose correctly.

Replace damaged measuring hoses and measuring sets or differential pressure switches for the internal pressure switchbox.



7.2.3 Test the internal pressure switchbox

The tests of the internal pressure switchbox is to be carried out only by qualified experts.

-
- See the internal pressure of the switchbox at operating unit at the pressure indication (rear side of the switchbox).
Internal pressure switchbox: → *please observe section "2.4 Technical data" (page 15)*
- Close the shutoff valve of the compressed air supply.

If the function of the differential pressure switch of the internal pressure switchbox is OK, the optical error indication has to react, the acoustic alarm has to sound and the heating has to switch off if it was connected before.

- Open the shutoff valve of the compressed air supply again.

If there is a variation from the internal pressure switchbox:

- Check the contact pressure of the switchbox cover seal
- Check the compressed air supply.



If the internal pressure switchbox cannot be set,
consult a service point of Vötsch (see annex).

7.2.4 Test the extracted-air flow rate

The test of the extracted-air flow rate is to be carried out only by qualified persons.

- Attach a pipe (length about 1 m) to the exhaust air conduct of the unit (stabilisation stretch).

At units with a fixed piping installation a measuring hole (diam. = 40 mm) has to be installed at a suitable place on the exhaust air line (on a straight pipe segment about 1 m behind the exhaust air conduct).

→ *please observe section "4.5.2 Exhaust air system" (page 30)*

- Measure the minimum extracted-air flow rate of the cold dryer with the fresh air fan running.

If there is a variation the extracted-air flow rate can be set at a mechanical damper flap in the fresh air line.

Extracted-air flow rate: → *please observe section "2.4 Technical data" (page 15)*



If the minimum extracted-air flow rate cannot be adjusted.
please contact a Vötsch-Service point (see appendix).



7.2.5 Test the safety temperature limiter (STL)

Instead of the installed temperature sensor PT 100 an external decade resistor has to be connected which can generate different resistance values.

- **Disconnect the main switch.**
- **Disconnect the temperature sensor PT 100 and connect a calibrated a decade resistor to simulate the temperature sensor PT 100.**
- **Connect the main switch.**
Secure the heating operation of the unit with its safety flushing time and the self-monitoring of the STL.
→ please see section "5.5.5 Check of the error message temperature (STL)" (page 44)
- **Set the resistance value at the decade resistor for 5°C below the switch-off temperature of the Safety temperature limiter (STL).**
(see the below table)
 - Safety temperature limiter (STL) must not trigger.
 - The heating operation of the unit is continued.
- **Set the resistance value at the decade resistor for 10°C above the switch-off temperature of the Safety temperature limiter (STL).**
(see the below table)
 - Safety temperature limiter (STL) switches off, pilot lamp "Temperature error" is shining.
 - Heating is disconnected, pilot lamp "Heating" goes out.
 - Emergency flushing of the heating channels and of the working space with compressed air is started, pilot lamp "Emergency flushing activated" is shining.
- **Underspend the resistance value at the decade resistor for the switch-off temperature of the safety temperature limiter (STL).**
(see the below table)
- **Acknowledge the error of the safety temperature limiter (STL):**
Operate the switch key "reset".
 - Safety temperature limiter (STL) switches on, pilot lamp "Temperature error" goes out.
 - Emergency flushing of the heating channels and of the working space with compressed air is switched off, pilot lamp "Emergency flushing activated" goes out.
 - Heating is connected, Pilot lamp "Heating" is shining.

Resistance values for the switch-off temperature of the safety temperature limiter (STL)

Ignition temperature class	T1	T2	T3	T4
Resistance value at switch-off temperature	240 °C 190,45 Ohm	240 °C 190,45 Ohm	175 °C 166,61 Ohm	120 °C 146,06 Ohm
Resistance value at 5°C above switch-off temperature	245 °C 192,26 Ohm	245 °C 192,26 Ohm	180 °C 168,46 Ohm	125 °C 147,94 Ohm
Resistance value at 5°C below switch-off temperature	235 °C 188,63 Ohm	235 °C 188,63 Ohm	170 °C 164,76 Ohm	115 °C 144,17 Ohm



7.2.6 Test the temperature limit cut-out (TLC) ^{1.)}

Test the serviceability at least once per month by instructed skilled personnel.

- **Connect the main switch.**

Secure the heating operation of the unit with its safety flushing time and the self-monitoring of the STL.

→ *please see section "5.5.1 Check of the fresh air fan and the heating" (page 40)*

- **Set the TLC to a temperature **lower** than the current temperature.**

(Operating: → *please see section "5.6.4 Temperature limit cut-out (TLC) ^{1.)}" (page 50)*

- Temperature limit cut-out (TLC) switches off, pilot lamp "Temperature error" is shining.
- Heating is disconnected, pilot lamp "Heating" goes out.
- Emergency flushing of the heating channels and of the working space with compressed air is started, pilot lamp "Emergency flushing activated" is shining.

- **Set the TLC again to a temperature **higher** than operating temperature.**

- **Acknowledge the error of the temperature limit cut-out (TLC):**

Press the P-key for 3 sec.

- Temperature limit cut-out (TLC) switches on, pilot lamp "Temperature error" goes out.
- Emergency flushing of the heating channels and of the working space with compressed air is switched off, pilot lamp "Emergency flushing activated" goes out.
- Heating is connected, Pilot lamp "Heating" is shining.

Faulty selectable temperature limiters have to be replaced.

^{1.)} *additional equipment*



7.2.7 Other repeating tests

- | | |
|---|--|
| Door seal | - for damages and contact pressure.
- treat it with a wet cloth. |
| Door switch | - test it for wear. |
| Closing bars
and door hinges | - test them for wear
- lubricate slightly. |
| Working space | - remove residuals (condensate). |
| Supply air lines
exhaust air lines | - check for tightness and damages.
- remove residuals (condensate). |
| Measuring set of the
exhaust air | - check for damages.
- remove residuals (condensate). |
| Fresh air fan | - check for damages. |
| Compressed air
components | - check for tightness and damages. |
| Silencer | - check for damages. |

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7.3 Repair



Notes:

Hazardous conditions must not appear by an explosive atmosphere in the surroundings of the dryer for the repair of the unit.

Work on the opened switchbox during the repair have to be done only by instructed service personnel.

Part of this work is e.g. the measuring of currents or the setting of the safety temperature limiter (STL).

The differential pressure switch of the internal pressure switchbox has to be set to the lowest value to enable the operation of the dryer with the opened switchbox.

The monitoring of the internal pressure switchbox is out of operation in this way.



Only approved spare parts have to be used.



After the repair of electrical components a safety test has to be carried out.

The following has to be verified at this:

- Visual check of the workmanlike execution.
- Insulation resistance > 1 MOhm
- Protective conductor resistance < 0,1 Ohm
- Equivalent leakage current < 15 mA



The switchbox cover has to be closed after finishing the repair.

The differential pressure switch of the internal pressure switchbox has to be set again.

Differential pressure switch internal pressure switchbox : → *please observe section "7.2.2 Test the differential pressure switch internal pressure switchbox" (page 57)*

The contact pressure of the switchbox cover seal and the internal pressure switchbox have to be checked.

Internal pressure switchbox: → *please observe section "7.2.3 Test the internal pressure switchbox" (page 57)*



The switchbox cover has to be closed for a correct check of the complete function of the unit after the repair to enable the overpressure in the switchbox.



7.3.1 Differential pressure switch and measuring sets of the exhaust air

Replace damaged measuring hoses and measuring sets or differential pressure switches for the exhaust air.

Set the differential pressure switch exhaust air to 1,2 mbar:



After replacing the differential pressure switch it has to be sealed with lacquer and tested for correct functioning.

Differential pressure switches exhaust air: → *please observe section "7.2.1 Test the differential pressure switches exhaust air" (page 56)*



7.3.2 Differential pressure switch of the internal pressure switchbox

Replace damaged measuring hoses and measuring sets or differential pressure switches for the internal pressure switchbox.

Set the differential pressure switch exhaust air to 0,8 mbar:



After replacing the differential pressure switch for the internal pressure switchbox it has to be sealed with lacquer and tested for correct functioning.

Differential pressure switch internal pressure switchbox: → *please observe section "7.2.2 Test the differential pressure switch internal pressure switchbox" (page 57)*



7.3.3 Safety temperature limiter (STL)

Replace the defective safety temperature limiter.

The exchange and the setting of the safety temperature limiter should to be done exclusively by our service to guarantee a correct and expert repair.



After replacing the safety temperature limiter it has to be tested for correct functioning. Safety temperature limiter (STL): → *please observe section "7.2.5 Test the safety temperature limiter (STL)" (page 59)*



Setting of the disconnecting temperature:

- Take over the disconnecting temperature of the previous safety temperature limiter.

Disconnecting temperature: → *please observe section "2.4 Technical data" (page 15)*



7.3.4 Temperature limit cut-out (TLC) ^{1.)}

Replace the defective selectable temperature limiter.

The exchange and the setting of the temperature limit cut-out should to be done exclusively by our service to guarantee a correct and expert repair.



After replacing the temperature limit cut-out it has to be tested for correct functioning. Temperature limit cut-out (TLC): → *please observe section "7.2.6 Test the temperature limit cut-out (TLC) ^{1.)}" (page 60)*



Setting of the disconnecting temperature:

- Take over the disconnecting temperature of the previous selectable temperature limiter.

Disconnecting temperature: → *please observe section "2.4 Technical data" (page 15)*

^{1.)} *additional equipment*



7.3.5 Door seal and contact pressure of the door

Replace the damaged door seal:

- Loosen the screws of the exterior casing only slightly for replacing the door seal, pull the damaged door seal from the sheet metal and attach the new door seal in the same way.
- Fasten again the screws of the exterior casing.

Set the contact pressure of the door seal:

- For setting the contact pressure at the hinge side loosen the screws of the hinges only slightly, align the door and fasten the screws again.
- For setting the contact pressure at the closure side remove the circlip at the stop bolt, pull the stop bolt out and set both eyebolts by turning them.
- Push the stop bolt in again and fix it with the circlip.



7.3.6 Door lock and closing bars

Replace defective door lock and closing bars:

- Dismantle the door and collocate it horizontally.
- Cut out the silicone gap carefully.
- Remove the interior sheet metal of the door.
- Remove the residual silicone.
- Remove carefully the thermal insulation.
- Replace defective parts.
- The assembly is done in reversed order.
- Fill the gap between interior sheet and exterior sheet of the door with silicone. (suitable silicone on request)



7.3.7 Door switch and actuator bar

Replace defective door switch and actuator bar:

- Mark the position of the setting ring of the switch actuation.
- Remove the door switch.
- Remove the setting ring of the switch actuation.
- Remove the feedthrough plate in the rear and/or in front.
- Take out the actuator bar with the compression spring.
- Replace the defective parts.
- The assembly is done in reversed order.



The door switch has to be actuated by the setting ring when the door is closed.

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7.3.8 Disassembly of the heating

- Unscrew the sheet metal cover at the rear side.
- Dismantle the intermediate channel in the heating box and disconnect the heating connections and mark them.
- Loosen the fastening screws of the heating box.
- Remove the heating.
- Check the seal of the heating box and replace if necessary.
- The assembly is done in reversed order.



7.3.9 Disassembly of the fresh air fan

- Separate the fresh air piping.
- Disconnect the electric connections of the fresh air fan and mark them.
- Loosen the fastening screws of the fresh air fan.
- Take the fresh air fan out.
- Check the tightness of the flange seal and replace it if necessary.
- The assembly is done in reversed order.

Defective, running out of true or defective fans have to be replaced.



A repair of the fresh air fan has to be done only by the manufacturer to guarantee a correct and expert repair.



When disassembling the heating and the fresh air fan or replacing the door seal, special attention has to be paid to the hazard of injuries by contusion or cutting.

Recommendation:

Use suitable protection equipment.

For further repairs:

Contact a service point of Vötsch (see appendix).



Notice:

When disposing of a dryer the door has to be removed for safety reasons, to avoid the danger of locking up oneself or somebody.

→ *please observe section "4.9 Disposal" (page 34)*

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7.4 Cleaning



Before cleaning the unit switch off the main switch and lock it against re-connection.

Clean the working space and equipment and the exhaust air lines.

Avoid explosive mixtures at the erection location.



Cleaning equipment of steel must not be used (brushes, scraper, etc.).
Steel parts - also when made of spark proof material - may produce sparks on the metallic surfaces which could ignite explosive mixtures.

Cleaning only when the unit is cold.



Use only usual in the trade household detergents.

Take care of a sufficient venting during the cleaning.



Do not use combustible, toxic or acidiferous detergents.

Clean the door seal with a wet cloth.

Set the dryer in operation only after a sufficient venting.



Recommendation:

Use suitable protection equipment.

Maintenance

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8 CONNECTION DIAGRAM

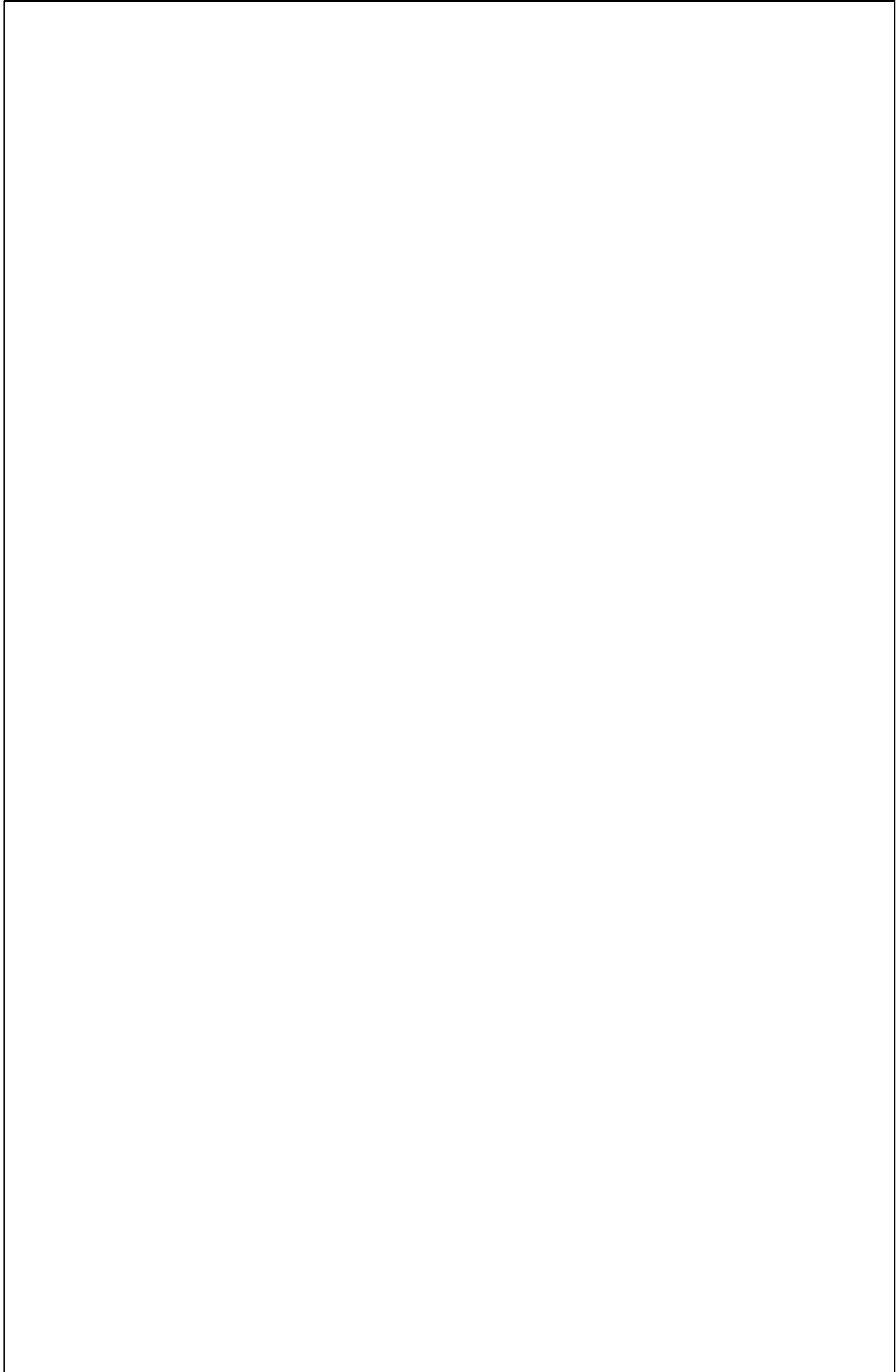
8.1 Spare parts list of the switch box

- in the connection diagram appendix

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Connection diagram



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9 SPARE PARTS LIST

vor 400 V, 3~

Heating

Tubular heating element (18 x 0,55 kW, 230 V) (E3)	63 620 214
Sealing for heating box, silicone grey (6.0 m)	50 010 995
Connection rail phase (copper)	52 497 261
Connection rail neutral conductor (copper)	52 497 262

Ventilation

Fresh air fan (M2)	63 522 078
Seal for fresh air fan suction side	52 497 251
Seal for fresh air fan blowing side	52 497 253
Damper flap with tube bend 90°	52 301 116
Swing-type check valve NW 100	63 702 017
Differential pressure switch exhaust air 0,2 ... 3,0 mbar (F10, F10.1)	50 021 476
Hose for measuring set (2 m)	53 667 303
Hose clamps for measuring set	53 659 003
Hose clamps for differential pressure switch	53 659 006

Door

* Door seal silicone red (3.2 m)	62 959 089
* Door seal viton (3.2 m) ^{1.)}	60 879 180
* Hinge sliding bush (top, bottom)	52 797 231
* Locking bar for door locking	52 497 230
* Door lock complete. (without closing bar)	52 040 121
* Closing bar (top, bottom)	50 040 678
* Guide sheet for door linkage (brass)	52 086 209
Door handle	63 270 029
Door switch (S1)	63 302 020

Temperature sensor

Resistance thermometer 2 x Pt 100 (B1)	50 018 088
Resistance thermometer (TLC) 2 x Pt 100 (B3)	50 018 088

^{1.)} additional equipment

* wearing part for 2-year service

Subject to changes

Spare parts list

Compressed air

Pressure-reducer compressed air connection	63 692 008
Solenoid valve emergency flushing (Y4)	63 696 065
Throttle valve emergency flushing	62 630 043
Silencer	61 323 308
Pressure-reducer switchbox flushing	63 692 006
Throttle valve switchbox flushing	63 692 009
Double 4/2-way valve switchbox flushing	62 633 009
Pressure-reducer internal pressure switchbox	63 692 006
Throttle valve internal pressure switchbox	63 692 009
Differential pressure switch internal pressure switchbox (F3)	50 021 476
Pressure gauge internal pressure switchbox	63 720 051

Inserts ^{1.)}

Angular supports ^{1.)}	52 250 210
Wire-mesh shelf ^{1.)}	52 497 260
Charging trays 1/1 ^{1.)}	52 497 270
Charging trays 1/2 ^{1.)}	52 497 271

Lead-through DN 25 KF ^{1.)}	62 660 006
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^{1.)} additional equipment

* wearing part for 2-year service

Subject to changes

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10 DOCUMENTATION

Temperature controller dTRON 04.1	Jumo
Temperature controller / program controller Dicon 501 ^{1.)}	Jumo
Safety temperature limiter (STL) TB40	Philips
Test certificate / conformity statement	TÜV
Certificate of compliance CE	Vötsch
Service points	Vötsch

^{1.)} *additional equipment*

Manufacturer's address

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Please indicate the data on the nameplate for checkback and spare part orders!



The information and statements of the German Operating Instructions are binding upon translations in other languages!

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Subject to technical changes

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